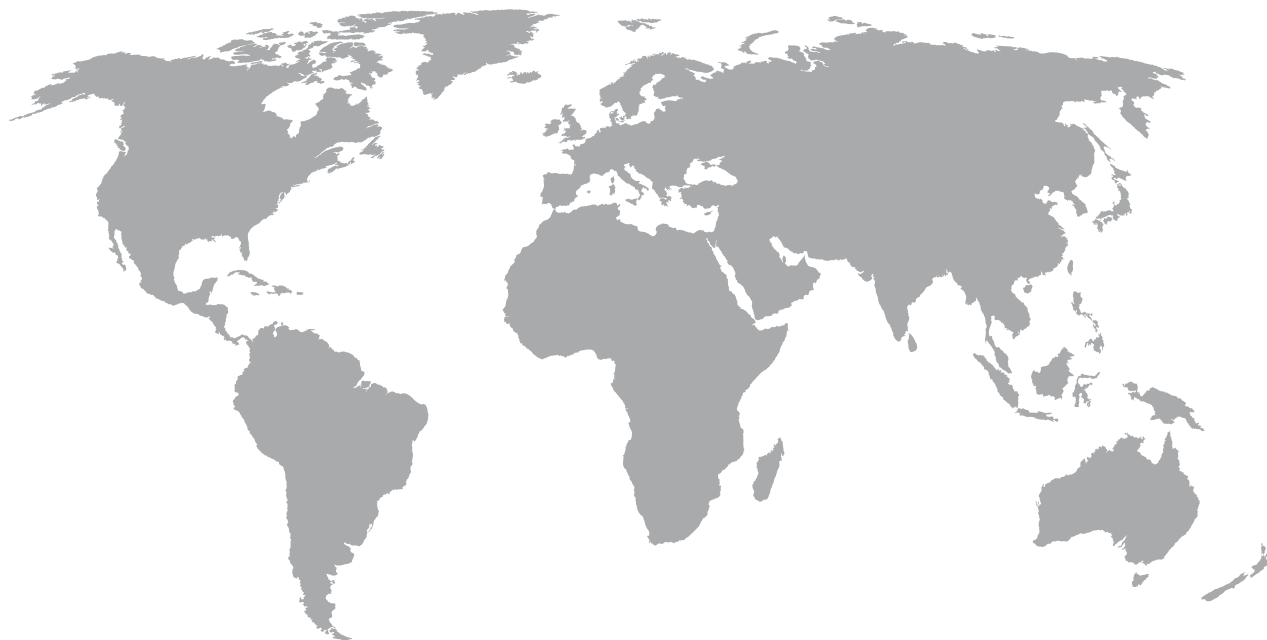




# Global Adult Tobacco Survey (GATS)



## Implementation Instructions



# **Global Adult Tobacco Survey (GATS) Implementation Instructions**

September 2020

## **Global Adult Tobacco Survey (GATS) Comprehensive Standard Protocol**

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### **GATS Questionnaire**

Core Questionnaire with Optional Questions  
Question by Question Specifications

### **GATS Sample Design**

Sample Design Manual  
Sample Weights Manual

### **GATS Fieldwork Implementation**

Field Interviewer Manual  
Field Supervisor Manual  
Mapping and Listing Manual

### **GATS Data Management**

Programmer's Guide to General Survey System  
Core Questionnaire Programming Specifications  
Data Management Implementation Plan  
Data Management Training Guide

### **GATS Quality Assurance: Guidelines and Documentation**

#### **GATS Analysis and Reporting Package**

Fact Sheet Templates  
Country Report: Tabulation Plan and Guidelines  
Indicator Definitions

#### **GATS Data Release and Dissemination**

Data Release Policy  
Data Dissemination: Guidance for the Initial Release of the Data

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Disclaimer: The views expressed in this manual are not necessarily those of the GATS collaborating organizations.



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# 1. Introduction

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Tobacco use is a major preventable cause of premature death and disease worldwide, with approximately 1.4 billion people age 15 years or older using tobacco<sup>1</sup>. Furthermore, more than 8 million people die each year due to tobacco-related illnesses<sup>2</sup>. If current trends continue, tobacco use may kill a billion people by the end of this century, and it is estimated that more than three quarters of these deaths will be in low- and middle-income countries<sup>3</sup>. An efficient and systematic surveillance mechanism is essential to monitor and manage the epidemic.

The **Global Adult Tobacco Survey (GATS)**, a component of Global Tobacco Surveillance System (GTSS), is a global standard for systematically monitoring adult tobacco use and tracking key tobacco control indicators. GATS is a nationally representative household survey of adults 15 years of age or older using a standard core questionnaire, sample design, and data collection and management procedures that were reviewed and approved by international experts. GATS is intended to enhance the capacity of countries to design, implement and evaluate tobacco control interventions.

In order to maximize the efficiency of the data collected from GATS, a series of manuals has been created. These manuals are designed to provide countries with standard requirements as well as several recommendations on the design and implementation of the survey in every step of the GATS process. They are also designed to offer guidance on how a particular country might adjust features of the GATS protocol in order to maximize the utility of the data within the country. In order to maintain consistency and comparability across countries, following the standard protocol is strongly encouraged.

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**GATS manuals provide systematic guidance on the design and implementation of the survey.**

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## 1.1 Overview of the Global Adult Tobacco Survey

GATS is designed to produce national and sub-national estimates among adults across countries. The target population includes all non-institutionalized men and women 15 years of age or older who consider the country to be their usual place of residence. All members of the target population will be sampled from the household that is their usual place of residence.

GATS uses a geographically clustered multistage sampling methodology to identify the specific households that Field Interviewers will contact. First, a country is divided into Primary Sampling Units, segments within these Primary Sampling Units, and households within the segments. Then, a random sample of households is selected to participate in GATS.

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**The GATS interview is composed of two parts: *Household Questionnaire* and *Individual Questionnaire*. These questionnaires are administered using an electronic data collection device.**

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<sup>1</sup> World Health Organization. WHO report on the global tobacco epidemic, 2019: Offer help to quit tobacco use. Geneva, Switzerland: World Health Organization; 2019. <https://apps.who.int/iris/bitstream/handle/10665/326043/9789241516204-eng.pdf?ua=1>

<sup>2</sup> GBD 2017 Risk Factor Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Seattle, WA: Institute for Health Metrics and Evaluation; 2018.

<sup>3</sup> Mathers, C.D., and Loncar, D. Projections of Global Mortality and Burden of Disease from 2002 to 2030. *PLoS Medicine*, 2006, 3(11):e442.

The GATS interview consists of two parts: the *Household Questionnaire* and the *Individual Questionnaire*. The *Household Questionnaire* (household screening) and the *Individual Questionnaire* (individual interview) will be conducted using an electronic data collection device.

At each address in the sample, Field Interviewers will administer the *Household Questionnaire* to one adult who resides in the household. The purposes of the *Household Questionnaire* are to determine if the selected household meets GATS eligibility requirements and to make a list, or roster, of all eligible members of the household. Once a roster of eligible residents of the household is completed, one individual will be randomly selected to complete the *Individual Questionnaire*. The *Individual Questionnaire* asks questions about background characteristics; tobacco smoking; electronic cigarettes; smokeless tobacco; cessation; secondhand smoke; economics; media; and knowledge, attitudes, and perceptions about tobacco.

## 1.2 Use of this Manual

This document aims to provide practical, step-by-step, and easy-to-follow instructions to implement the GATS process. It also introduces the experts and objective reviewers available to provide countries with an ongoing technical exchange.

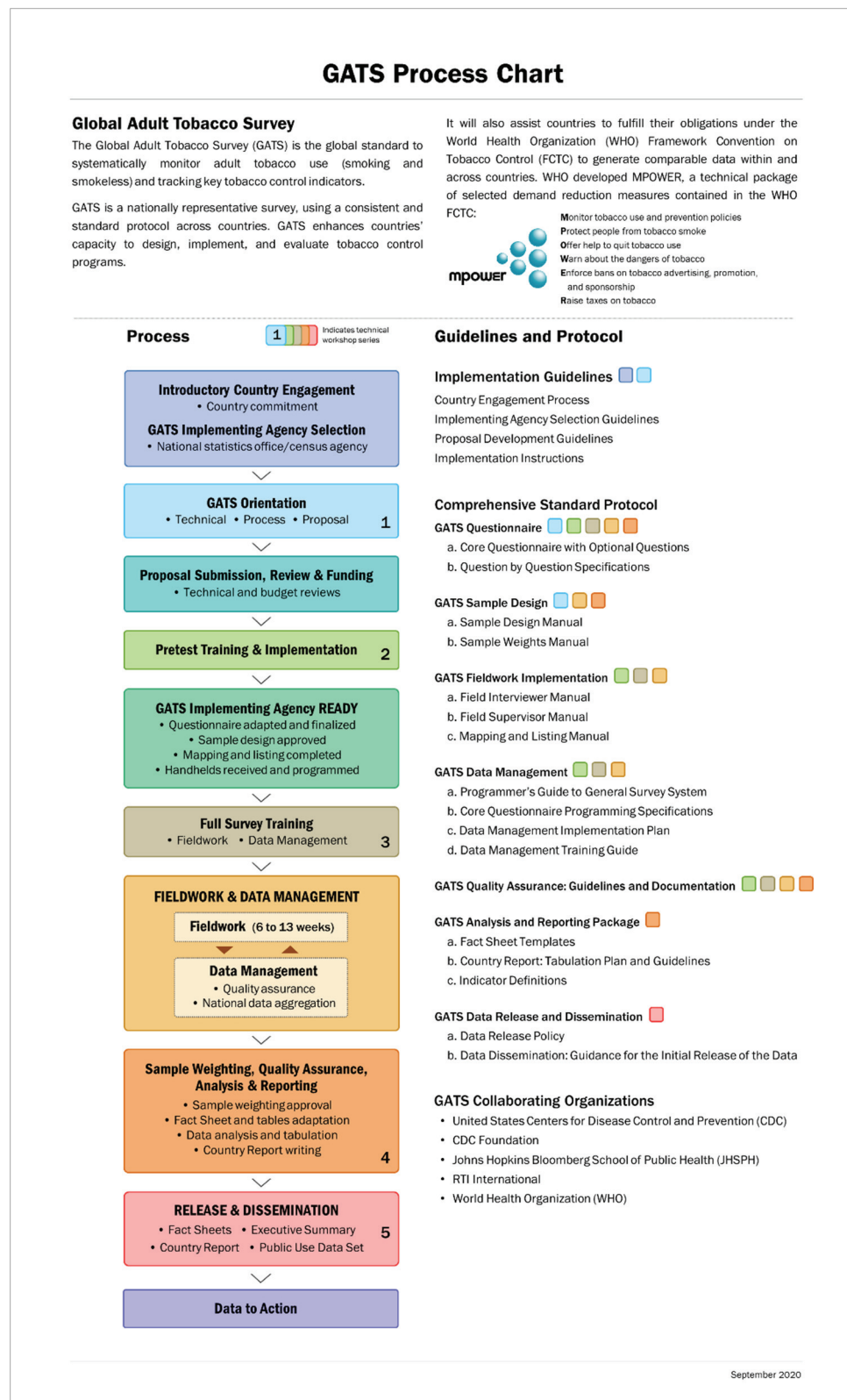
## 1.3 GATS Process Overview

The *GATS Process Chart* (Section 1.4) provides an overview of all the steps involved in carrying out GATS, from initial engagement and planning until releasing and disseminating results. A brief summary of these steps is provided below, while the rest of this manual provides further details.

- Country engagement and implementing agency selection: GATS partners engage with a country that is interested in conducting GATS and ultimately obtain official commitment from the country. This may include a visit to the country by GATS partners to meet with relevant in-country officials (e.g., Ministry of Health). As part of engagement, an implementing agency (e.g., national statistical office) will be selected to conduct the data collection.
- Orientation: Participating countries will attend GATS orientation to learn about all aspects of conducting the survey and will work with GATS partners to start developing the country-specific questionnaire, sample design, data management plan, and proposal. The country participants should include a tobacco control focal point, sample design expert, survey manager, and an IT/Data management expert. Typically, GATS orientations include multiple countries and are hosted by CDC and CDC Foundation in Atlanta, Georgia but sometimes are conducted in-country.
- Proposal development: Participating countries will submit a technical proposal, which details all aspects of conducting GATS along with a detailed budget proposal (unless the country is fully self-funding GATS). The proposal includes the country-adapted questionnaire, sample design, data management plan, data collection protocol, and timeline. The proposal and budget are reviewed and approved by GATS partners.
  - GATS Questionnaire Review Committee (QRC): GATS QRC will review and approve the country-adapted questionnaire.

- GATS Sample Review Committee (SRC): GATS SRC will review and approve the country-specific sample design.
- GATS Pretest: A small-scale pretest will be conducted to test the survey questions, the programmed questionnaire, and data collection and management procedures. GATS pretest includes four aspects: 1) IT/Data management training workshop (training and set-up of handheld devices and data management software), 2) Field staff training workshop (training of interviewers and supervisors to conduct data collection), 3) Pretest fieldwork interviews (at least 100 interviews are recommended involving a mix of demographic characteristics such as urban/rural, gender, age, and tobacco use status), and 4) Debriefing and reporting (gathering lessons learned and proposed updates to the questionnaire, program, and/or protocol).
- Finalization of protocol: All aspects of the country protocol are finalized including: a) questionnaire and translation, b) questionnaire program, c) approved sample design and sample selection carried out, d) mapping and listing conducted (if applicable), e) handheld devices acquired and set-up, and f) proposal approved and funding in-place.
- Full survey training: The structure of full survey fieldwork training will be decided by the country. For example, some countries prefer to conduct one national training for all field staff while other countries prefer to conduct multiple regional trainings. An important piece of full survey training is making sure the handheld devices are ready to use in the field and that interviewers are fully trained on how to use them properly.
- Fieldwork: The implementing agency will conduct data collection. Field interviewers will use handheld devices to conduct the surveys and then transmit data back to the national office. Similar to full survey training, countries will decide on their structure of data collection – for example, having teams travel around the entire country or having regional staff conduct data collection in their designated areas. The length of data collection will depend on the sample size, size of the country, number of field staff, and any other country-specific factors. The implementing agency will ensure the high quality of the data by using various methods including monitoring, validation, re-interview, and productivity and data review.
- Data cleaning, weighting, and analysis: Once data collection is completed, the countries will work with CDC to aggregate and clean the data. Then sample weights will be produced and reviewed/approved by the SRC. Data analysis will be conducted to produce estimates for fact sheets and country-report tables. An analysis workshop will provide an opportunity for the country to review the results with GATS partners and to start developing their country-specific fact sheet, executive summary, and report.
- Data release and dissemination: Countries will officially release the GATS results to the public. Typically, a release event is organized which includes presentations made to government officials, partner organizations, and the media. Countries may present their fact sheet (and executive summary) at the initial release and then prepare their country report later or they may wish to release all documents at the same time.

## 1.4 GATS Process Chart



## 2. Questionnaire: Adaptation, Review, and Finalization Process

This chapter provides information on country-specific GATS questionnaire adaptation including processes for questionnaire review and approval, translation, adaptation, and programming. The GATS Questionnaire Review Committee (QRC) oversees the questionnaire review and approval process. Participating GATS countries and GATS partners should adhere to these guidelines in order to maintain quality control and efficiency for GATS preparations.

### 2.1 Review Process and Timeline

Action Number	Responsible	Task
1	CDC	<ul style="list-style-type: none"><li>Send <i>GATS Core Questionnaire with Optional Questions</i> with all other required manuals to country IA.</li></ul>
2	IA	<ul style="list-style-type: none"><li>Review and discuss the questionnaire with the in-country Ministry of Health (MoH) and technical experts prior to first technical workshop, as necessary.</li><li>Prepare a summary if any issues are raised (e.g., policy concerns) and additional questions to be discussed in the first technical workshop.</li></ul>
3	IA, WHO RO, CDC, QRC	<ul style="list-style-type: none"><li>First technical workshop: GATS Orientation.</li><li>Review summarized issues and the questionnaire with in-country technical experts for adaptation. (Note: The questionnaire should be available in the local language if required and core questionnaire should be adapted to country situation.)</li><li>An adapted questionnaire will be prepared by IA.</li></ul>
4	IA	<ul style="list-style-type: none"><li>IA works with MoH and technical experts to finalize the adapted questionnaire and formally submit the adapted version of questionnaire (in English) to CDC focal point.</li></ul>
5	CDC, QRC	<p>Review Process (before pretest):</p> <ul style="list-style-type: none"><li>CDC will review, format (if needed), and submit the country-adapted questionnaire to the QRC for expert review.</li><li>CDC compiles the recommendations from QRC, sends to IA, and asks countries for consideration.</li><li>Communication between IA focal point and CDC/QRC, to finalize the questionnaire as needed.</li><li>Forward a copy to all partners for pretest implementation.</li></ul>
6	IA	<ul style="list-style-type: none"><li>IA works with MoH and technical experts to modify the questionnaire from the lessons learned in the pretest and forward the modified full survey questionnaire (in English) to CDC focal point.</li></ul>
7	CDC, QRC	<p>Review Process (after pretest):</p> <ul style="list-style-type: none"><li>CDC focal point sends full survey questionnaire to QRC for final review.</li><li>QRC reviews the full survey questionnaire and provides feedback (if there are issues, CDC focal point will schedule a call with IA for resolution).</li><li>CDC finalizes questionnaire with IA.</li><li>Forward a copy to all partners for full survey implementation.</li></ul>

CDC      U.S. Centers for Disease Control and Prevention  
IA        Implementing Agency  
QRC      Questionnaire Review Committee  
WHO RO   World Health Organization Regional Office

**Notes:**

- The process is strictly confidential and at any stage the questionnaire, in part or full, should not be disclosed or shared with any other members or persons outside the QRC without the prior approval/permission from the IA and CDC.
- Communication between the IA and CDC focal point should be copied to the WHO RO.
- Edits to questionnaires and supporting documents in the above process should be done using track changes.
- Titles of documents should consist of the date in which they were created to ensure version control.

**Timeline for QRC Review Process**

Action Number	Task	Approximate Number of Days
5	CDC review on skip patterns and formatting.	2 working days
5	QRC will review adapted version of questionnaire and compile comments.	7 working days
5	Communication/discussion regarding QRC comments. (If needed, a conference call will be organized with available QRC members and IA focal point to finalize questionnaire. The CDC focal point will schedule the call.)	TBD
5	CDC adapts and finalizes the questionnaire.	2 working days
7	Further QRC review and finalization of questionnaire after pretest, as required.	TBD

**Note:** QRC members are requested to give their comments in writing (suggested revisions/options for the questions) to ease the process. Timeline can be impacted by review complexity or additional consultation needs.

**2.2 Translation of Questionnaires into Local Language(s)**

Translations and back translations of questionnaires should be done independently by language experts. Content and survey experts should review the translations for appropriateness. There are two options for translating the questionnaire into the local language that intertwine with the questionnaire review process.

**Option #1:**

- The GATS core questionnaire is translated into the local language and country-adaptations are made in the local language.
- A draft country-adapted questionnaire is finalized in the local language.
- The final draft of the country-adapted questionnaire is translated into English.
- The final draft English version of the country-adapted questionnaire is sent to CDC for submission to the QRC for review.
- The English version of the country-adapted questionnaire is finalized with QRC, CDC, and IA.
- Any final revisions made to the English version are incorporated into the local language version (CDC/QRC will verify accuracy with IA, as needed).

**Note:** In this option, the QRC is reviewing the country-adaptations to the core questionnaire and also reviewing the back-translated version of the questionnaire (for accuracy of translation) at the same time.

**Option #2:**

- Country-adaptations are made in English using the GATS core questionnaire.
- A draft country-adapted questionnaire is finalized in English.
- The final draft English version of the country-adapted questionnaire is sent to CDC for submission to the QRC for review.
- The English version of the country-adapted questionnaire is finalized with QRC, CDC, and IA.
- The final English country-adapted questionnaire is translated into the local language.
- The local language country-adapted questionnaire is back-translated into English.
- The back-translated questionnaire is reviewed by CDC/QRC to ensure accuracy (if there are issues, CDC focal point will schedule a call with IA for resolution).

**Note:** In this option, the country-specific questionnaire is adapted, reviewed, and finalized in English. The final English version is then translated into the local language and back-translated in English. The back-translated version is then submitted for final review to ensure accuracy.

## **2.3 Guidelines for Country-Adaptations to the Core Questionnaire**

### ***Processes for Adapting the Core Questionnaire***

- Start with the *GATS Core Questionnaire with Optional Questions*.
- Do not revise standard core questions (except for country specific categories).
  - Maintain consistency for country comparison.
  - May be exceptions (provide justification to QRC).
- Modify question item lists (where instructed).
  - Example: Types of smoking tobacco (cigarettes, bidis, cigars, etc.) relevant for country.
- Modifying response options (where instructed).
  - Example: List of common cigarette brands for country.
- Incorporate questions from the list of suggested optional questions.
- Include additional country-specific questions.
  - Include questions deemed important.
  - Be aware of length.
- Remove core questions that are not relevant to the country.
  - Example: Smokeless tobacco questions C04-C18 are optional.

### **Standard Conventions for Adapting the Core Questionnaire**

- **Highlight** all country adaptations to the GATS core questionnaire (for ease of reference).
  - Item lists, response categories, optional questions, and country added questions.
- Use ~~strike through~~ to indicate any core questions that country wants to delete (for ease of reference).
- Maintain core and optional question numbering and ordering to maintain consistency for country comparison (as much as possible).
- For newly added country questions: Use double lettering depending on the section (e.g., AA10, BB17, EE4).
  - Won't disrupt current numbering by adding in new country questions.
- Only change skip instructions if needed to accommodate either 1) added optional questions or 2) country added questions.
- Limit the number of additional questions to keep questionnaire at a reasonable length.
- Limit the complexity of additional questions for ease of programming each country questionnaire.
- Provide justification for 1) Including additional country questions, and 2) Deleting/revising standard core questions (not including the core question lists/response categories that the country should adapt).
  - Justification for adaptations helps to make the QRC review process more efficient.

### **Process for Repeat Countries**

- Start with the previous country-adapted questionnaire.
- Evaluate questionnaire and data.
  - Remove any optional and country-added questions that were or no longer are useful.
- Review changes in tobacco control landscape including policy changes, program interventions, introduction of new tobacco products since last GATS.
  - Add optional and country-specific questions as needed.
- Be mindful of practical considerations such as length of questionnaire, resources/budget.

## **2.4 Guidelines for Questionnaire Programming Quality Control**

This section provides a list of guidelines for questionnaire programming version and process control. The guidelines listed below are organized under three areas: 1) major estimated timelines, 2) process conventions, and 3) quality control procedures.

### **Major Timeline Guidelines**

- Proposal approved 6-8 weeks prior to pretest training.
- Questionnaire programming in English begins 6 weeks prior to training.
- Hardware delivered and operational 4 weeks before training.



- Hardware localization issues start 4 weeks before training.
- Translations of software system menus and messages completed 1 week before training.
- Translation of questionnaire texts in all required country-specific languages completed and inserted into program 2 weeks before training.
- IA signoff on household and individual questionnaires (HQ and IQ) 1 week before training.
- IA IT staff take control and ownership of questionnaires at this point.
- Start version control of questionnaires with the signed off version above and maintain strict control after this point.

### ***Process Control***

- Survey/Field staff, rather than IT staff, are responsible for inserting country-specific language (translations) based on their country questionnaire.
- Survey director must approve programmed HQ and IQ in writing before field staff training (with version number).
- Text changes: A language change must echo through to all languages.
- Changing the programming logic (ranges, validity checks, etc.) of an approved questionnaire requires re-review by the QRC.
- Changing the content or wording of a question or responses requires re-review by the QRC.
- Version control of questionnaire files: Once CDC/RTI IT staff leaves, the IA owns the files and country IT/Survey staff are responsible for maintaining an audit trail of changes to questionnaires and programming specifications.
- After pretest debriefing and full implementation starts, country to send CDC/RTI the questionnaire program files. Any changes to the program should result in updated files being sent to CDC/RTI.

### ***Quality Control for Checking the Questionnaire***

- Programmers must update the version number every time a new questionnaire file is created. Also, this must be confirmed before starting to review the questionnaire. An archive of older files for history and backup is a good idea, even perhaps archiving files for HQ and IQ every day during heavy development.
- For every language, the full programming specifications are reviewed, and every question is checked against the specs. If any problems are found, the specs are marked, the problem is fixed, and then it is checked again on the handheld. This iterative process continues until every question is approved on the handheld. There is absolutely no wavering from this process. This must be done with a local language survey expert. It should not be relegated to programmers and certainly not to staff without the requisite language expertise.
- For every language, the count of (, ), [, ], {, and } symbols and HTML codes must be the same. Otherwise, this is re-checked and fixed.
- Skip patterns and English text are always fully tested. The goal is to make absolutely no changes to the questionnaire except fixes to the local language text while in-country.



### 3. Sample Design: Adaptation, Review, and Finalization Process

This chapter provides information for developing the country-specific GATS sample design and process for sample design and sample weighting review and approval. GATS Sample Review Committee (SRC) reviews and approve sample design, computation of sample weights, and quality assurance approvals. Participating GATS countries and GATS partners should adhere to these guidelines in order to maintain quality control and efficiency for GATS preparations.

#### 3.1 Review Process and Timeline

Action Number	Responsible	Task
1	CDC	<ul style="list-style-type: none"><li>Send <i>GATS Sample Design Manual</i> with all other required manuals/documentation to country IA and/or national statistical office (NSO), depending on country situation.</li></ul>
2	IA	<ul style="list-style-type: none"><li>Review standard sample design and acquire preliminary information required for the sample design discussions prior to first technical workshop.</li><li>Review and discuss the sample design with IA and/or NSO and technical experts, as needed, prior to first technical workshop.</li><li>Prepare a summary if any issues are raised (sample selection / frame / national or regional representation, etc.).</li></ul>
3	IA, WHO RO, CDC, SRC (as required)	<ul style="list-style-type: none"><li>First technical workshop: GATS Orientation.</li><li>Review summarized issues and the proposed sample design with the country technical experts for adaptation. (Note: Relevant information on sample selection and sample frame should be available.)</li><li>An adapted summary on sample design will be prepared either by IA and/or NSO, depending on country situation.</li></ul>
4	IA	<ul style="list-style-type: none"><li>Work with CDC focal point to finalize the adapted sample design and specifications (see <i>Section 3.4</i>), and formally submit the adapted version of sample design to CDC focal point.</li></ul>
5	CDC, SRC	<p>Review Process:</p> <ul style="list-style-type: none"><li>CDC focal point will submit the sample design proposal to the SRC for review.</li><li>Adapt the recommendations from SRC.</li><li>Once review is completed, IA will prepare a final sample design summary table for implementation.</li><li>Communication and technical assistance between IA and CDC to finalize sample design and selection as needed.</li></ul>
6	CDC, SRC, IA	<ul style="list-style-type: none"><li>Oversee and assist IA and/or NSO in drawing the sample according to suggested design features.</li><li>Summarize issues related to sample selection and other design related concerns and send to CDC focal point.</li></ul>
7	CDC, SRC	<ul style="list-style-type: none"><li>Provide on-going technical assistance in drawing the sample, if needed.</li></ul>

CDC      U.S. Centers for Disease Control and Prevention  
IA        Implementing Agency  
QRC      Questionnaire Review Committee  
WHO RO   World Health Organization Regional Office

**Notes:**

- The process is strictly confidential and at any stage the sample design, in part or full, should not be disclosed or shared to any other members or persons outside the SRC without the prior approval/permission from the IA and CDC.
- Communication between IA and CDC focal point should be copied to the WHO RO.
- In order to speed up the process, it is suggested and recommended to submit the adapted sample design to CDC focal point by IA focal point well in advance to full proposal submission.
- All the sample design materials should be cleared by SRC for proper and standard implementation.
- Titles of documents should consist of the date in which they were created to ensure version control.

**Timeline for SRC Review Process**

Action Number	Task	Approximate Number of Days
5	SRC will review the adapted version of sample design and provide compiled comments.	10 working days
5	Communication/discussion regarding SRC comments. (If needed, a conference call will be organized with available SRC members and IA and/or NSO focal point to finalize sample design. The CDC focal point will schedule the call.)	TBD
5	CDC focal point and IA jointly adapt and finalize the sample design.	2 working days
7	Further adaptation/implementation of sample design based on country need.	2 working days
7	Ongoing technical assistance will be provided by experts to IA as needed until the sample is drawn and implemented.	Ongoing

**Note:** SRC members are requested to give their comments in writing (with clarifications) to ease the process. Timeline can be impacted by review complexity or additional consultation needs.

**3.2 Information Request for Sample Design Discussion and Adaptation**

A standardized list of questions was developed for requesting information to assist with sample design discussion and adaptation. Countries will provide answers to the following list prior to the GATS Orientation to facilitate these discussions.

**1. Background Information for Sample Design Development**

- Population counts from administrative data, electoral data, or (preferably) the last census, with counts broken down by those population subgroups that are likely to define reporting subgroups for GATS findings (e.g., by age, sex, urban-rural, and geographic distribution at national and sub-national level, where applicable).
- The major geo-political area units in the country, such as region, division, province, state, district, village, etc. in a hierarchical order along with corresponding average population sizes.

- A profile of governmental and non-governmental organizations in the country with the capacity to design and select national household samples.

## **2. Recent National Household Surveys Whose Designs Might be Integrated with the GATS Survey Design**

- Year of survey, objectives, target population and inclusion/exclusion criteria, stages of sample selection, sampling units and frames used at each stage, number of responding households, and number of primary sampling units (PSUs).
- What estimation or data uses were considered in developing the design for this sample?
- What flexibility might the design offer to meet GATS sample size needs by gender, urban-rural, and region of the country?
- Details of the sample design are needed to determine: if the design produces a valid probability sample of households and residents, and what are the key features of the design (e.g., sampling units at each stage, use of stratification, definitions of the strata, allocation of the sample among strata, sample sizes overall and for key domains).
- Does the sample design have any special features, such as probability proportionate to size (PPS) selection of clusters, replication to facilitate panel rotation for measuring temporal change, etc.?
- Who was responsible for sample selection, when was sample selection completed, and what do we know about the experience and technical competency of those completing this task?
- Who was responsible for producing weights for the survey sample, when was sample weighting completed, and what do we know about the experience and technical competency of those completing this task?

## **3. Existing Multi-Purpose National Samples Whose Designs Might be Integrated with the GATS Sample Design**

- Examples: Recent master samples created by the NSO in the country for surveys as needed, such as DHS, STEPS, and other national surveys.
- Was the sample designed to target a specific population? If so, what are the specific criteria to define that population?
- What estimation or data uses were considered in developing the design for this sample?
- What flexibility might the design offer to meet GATS sample size needs by gender, urban-rural, and region of the country?
- Details of the sample design are needed to determine: if the design produces a valid probability sample of households and residents, and what are the key features of the design (e.g., sampling units at each stage, use of stratification, definitions of the strata, allocation of the sample among strata, sample sizes overall and for key domains).

- Does the sample design have any special features, such as probability proportionate to size (PPS) selection of clusters, replication to facilitate panel rotation for measuring temporal change, etc.?
- Who was responsible for sample selection, when was sample selection completed, and what do we know about the experience and technical competency of those completing this task?
- Who was responsible for producing weights for the survey sample, when was sample weighting completed, and what do we know about the experience and technical competency of those completing this task?
- Were the weights adjusted for nonresponse and calibrated to the population distribution? What was the approach followed in each of these tasks, if completed?
- What were the perceived barriers and expediciencies in working with those who designed, selected, and weighted the sample?

#### **4. Excluded Areas of the Country**

- Will any significant parts of the country need to be excluded from GATS?
- If so, what are the specific reasons for the exclusion?

#### **5. Feasibility to Integrate an Existing Sample in Producing the GATS Sample Design**

- Subsampling from an existing part of the existing sample? If so, which part? When the subsampling is done, who would likely do the subsampling?
- Sampling from an existing part of the sampling frame for the existing sample? If so, which part? How accessible will this part of the frame be to us?
- Simply adding a module to all or a part of the existing sample?
- Using the GATS as a source of subsampling for other surveys?

#### **6. Correlates of Tobacco Use for Sampling Stratification**

- Are there any existing socioeconomic characteristics at PSU level that could be used for stratification in PSU selection (e.g., measures of literacy, median household income, median education level for adults, etc.)?
- Are there any available correlates of tobacco use for subareas within PSUs for stratification in sampling the subareas?

#### **7. Knowledge of Non-Sampling Errors in Prior Surveys in the Country**

- Size of nonresponse, eligibility rates etc. as outlined in the GATS Sample Design Manual to understand the sample attrition.
- What are the sources of this information?

## 8. NSO Sampling and Survey Analysis Expertise and Experience

- What is the NSO's role and capacity to design valid and statistically efficient probability samples, conduct large-scale national surveys, compute weights, and analyze data from surveys with complex sample designs?
- What is the NSO's level of familiarity and facility with standard survey analysis software (e.g., SAS, STATA, SPSS)? If standard survey analysis software packages are not available to the NSO, what experience does it have in developing statistical software/programs for routinely computed and reported measures of the precision of survey estimates from complex sample designs?

### 3.3 Sample Design Proposal Template for Review and Finalization

Descriptions of sample design for review in proposals like GATS typically require that the authors tell the reader what they intend to do in some detail and give their reasons for the specifics of their approach. The level of detail in such a document should be sufficient to be reproducible, i.e., in sufficient detail so that the reader could actually carry out what is being proposed. Additionally, a checklist was developed to help ensure the completeness of the sample design proposal (see *Section 3.5*).

Looking into the complexity of design and to speed up and strengthen the review process, SRC suggests that countries use the following outline for preparing the sampling proposal for review on corresponding section(s) of the *GATS Sample Design Manual* indicated below in brackets. Please be noted that the *GATS Sample Design Manual* will be the basis for reference and to prepare the required documentation in detail to become the primary basis for the review and decision-making as to appropriateness of approach.

1. Introduction [1]
2. Survey Objectives [2]
3. Target Population and Sample Frame [3]
4. Summary of Sample Design Features\* [4]
5. Forming Primary Sampling Units (PSUs) [6]
6. First Stage of Sampling: Selecting PSUs [7]
7. Intermediate Stages and Selecting Households [8]
8. Selecting Individuals within Screened Households [9]
9. Determining Sample Sizes at Each Stage of Selection and Reporting [10]

This will help SRC to understand: 1) the rationale / justification for considering the design proposed by the countries, 2) to examine the precision and other quality aspects of the proposed design in comparison to the GATS standard design requirements. This will also be helpful to countries: 1) to describe in detail the process of sample implementation, various stages of sample selection including their selection probabilities, 2) to produce a country-specific sample weighting guidelines based on the sample weighting manual.

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\* Includes a sample design summary table which provides a tabular overview and specifications of the entire sample design (see *Section 3.4*).

### 3.4 Sample Design Summary Table

Sample Design Specification of GATS [Country]  
[Date prepared]  
[Eligibility Definition for Survey Population]

Stage	Sampling Unit and Frame Source <i>What is being sampled and from what sampling frame?</i>	Stratification <i>Stratify by what? Which sample allocation approach?</i>	Sample Selection <i>How will random selection be used?</i>	Overall Sample Size
1	Primary Sampling Unit (PSU):  <ul style="list-style-type: none"> <li>[NSO/Census] PSU Frame</li> <li>GATS Subsampling Frame:</li> </ul>	<ul style="list-style-type: none"> <li>[NSO/Census] Master Sample:</li> <li>GATS Subsample:</li> </ul>	<ul style="list-style-type: none"> <li>[NSO/Census] Master Sample:</li> <li>GATS Subsample:</li> </ul>	<ul style="list-style-type: none"> <li>GATS Subsample:</li> </ul> GATS PSU Selection Probability (To Be Recorded on Respondent Data File):
2	Secondary Sampling Unit (SSU):  <ul style="list-style-type: none"> <li>[NSO/Census] SSU Frame:</li> <li>GATS SSU Subsampling Frame:</li> </ul>	<ul style="list-style-type: none"> <li>[NSO/Census] Master Sample:</li> <li>GATS Subsample:</li> </ul>	<ul style="list-style-type: none"> <li>[NSO/Census] Master Sample:</li> <li>GATS Subsample:</li> </ul>	GATS Final SSU Selection Probability (To Be Recorded):
3	Tertiary Sampling Unit (TSU):  <ul style="list-style-type: none"> <li>GATS Household Frame:</li> </ul>			
4	Final Sampling Unit:  Frame:			



### 3.5 Sample Design Checklist

The *GATS Sample Design Manual*, *GATS Mapping and Listing Manual*, and *GATS Sample Weights Manual* are designed to offer both requirements and recommendations, as well as suggested guidelines for countries to follow as they develop appropriate sample design, data collection and weighting procedures for their implementation of GATS. The first step in this survey design process is the preparation of the GATS Sampling Design Proposal which is submitted to the GATS Survey Review Committee (SRC) for review and approval. The Sampling Design Proposal should be completed by trained statisticians identified in each country who will have primary responsibility for GATS sample selection, collaborating with country public health representatives.

Country statisticians should read and understand each relevant GATS manual fully before developing their sample design proposal. The CDC Focal Point assigned to assist countries in the design and implementation of GATS will work closely with statisticians and other country representatives in the preparation of the proposal. CDC survey statisticians are also available to provide technical assistance on sample design, selection and weighting. The following checklist offers country survey statisticians and public health representatives with the primary elements of survey design that should be described in the Sampling Design Proposal.

Once completed and reviewed by CDC, the proposal will be submitted to the SRC for formal review and approval. SRC review is an iterative process in which SRC members comment on the survey elements described in the Sampling Design Proposal and make suggestions for modifications to improve survey design and better align design elements with the GATS survey design protocol. Every sample design proposal should include sections that address the following review criteria. The list below is not a complete list of all things to include in the proposal, but rather items that are often overlooked or underspecified thus causing delays in completing the proposal review by the SRC.

In parentheses, we have provided sections of the GATS manuals that will be useful in preparing the GATS Sampling Design Proposal.

#### **Survey Objectives** (refer to *GATS Sample Design Manual Chapter 2*)

- Planned estimation domains/key reporting subpopulations and intended comparisons (cross sectional and/or across time in repeat surveys) are fully described.

#### **Target Population & Sample Frame** (refer to *GATS Sample Design Manual Chapter 3*)

- Target population is fully defined, including a listing of the criteria for eligibility.
- Any geographic exclusions explicitly described and proportions of country population excluded provided.
- Household residence requirement is described with any deviation and justification from GATS household residence criteria provided.
- A description of the area sampling frame is provided including source, recency and the count of areal clusters on the frame. Provide an explanation if the frame count is <1,000.
- If a Master Sample will be used as the frame to select the GATS sample rather than last census provide:

1. Reasons for using a Master Sample instead of creating a new sample just for GATS.
  2. Detailed information about the Master Sample design structure (i.e., # of selection stages, sampling units in each selection, and selection methods in each stage).
  3. Source and means of computing probabilities of selection for sample selection in each stage of the Master Sample.
  4. Detailed description of the approach to be followed in subsampling the Master Sample for GATS subsample are described to create the GATS sample.
- Count and percent of the country's population in each of the proposed explicit strata.
  - Definition of household to be used in creating the sampling frames for the household stage of sampling.

**Summary of Sample Design Features** (refer to *GATS Sample Design Manual Chapter 4*)

- A detailed definition of explicit and implicit strata is provided with description of frame sorting for selection within implicit strata.
- Sample sizes selected and final respondent sample sizes by explicit strata are provided for each stage of sample selection. These counts are consistent across survey proposal.
- Proportionality/disproportionality in sampling by strata is discussed and justified. Reasons for equal, proportionate, or some compromise allocation between urban and rural respondents is presented.
- PSU sampling rate is provided. Justification is made if rate exceeds 10%.
- Sample Design Summary Table is provided that fully describes sample design.

**Forming Primary Sampling Units (PSUs)** (refer to *GATS Sample Design Manual Chapter 6*)

- The primary sampling unit (PSU), the sampling unit in the first stage of selection, is explicitly defined.
- Average number of expected participating households per PSU is presented.

**First Stage of Sampling: Selecting PSUs using Probability Proportionate to Size** (refer to *GATS Sample Design Manual Chapter 7*)

- Specific PPS selection algorithm (e.g., Sampford's PPSWOR, PPSWR, PPS Systematic, etc.) and program used to select the PSU sample is provided.
- If PPS systematic selection is proposed for PSU selection, implicit stratification is described along with a plan to form pseudo stratum pairs of PSU to calculate variances for use later in analysis.

**Intermediate Stages & Selecting Households** (refer to *GATS Sample Design Manual Chapter 8* and *GATS Mapping and Listing Manual Chapters 4-5*)

- Secondary sampling unit (SSU) formation and the sampling frames for intermediate stages of selection are fully described.
- The sample selection method to be used in each intermediate and household stage of sampling is fully described.

- Description of how household lists will be formed.
- Steps proposed to assure the quality, accuracy, and completeness of household lists are described.
- Field worker supervision and training for household listing is provided.
- Justification for gender randomization, if used, is provided.

**Selecting Individuals within Screened Households** (refer to *GATS Sample Design Manual Chapter 9*)

- Method of selection of individuals within households is provided with justification of the proposed approach differs from the GATS protocol.

**Determining Sample Sizes at Each Stage of Selection & Reporting** (refer to *GATS Sample Design Manual Chapter 10*)

- Where sample sizes deviate from GATS recommendations, respondent sample sizes based on precision requirements by key reporting populations are given with mathematical justification. These calculations should, if possible, be based on Design Effect (DEFF) values from recent similar country health surveys.
- Sample sizes for repeat surveys are computed using DEFF values available from prior GATS rounds and considering power to detect difference in rates between baseline and repeat rounds. 80% power is preferred for all key reported differences. (Note: Power calculations have already been done for many GATS countries, and are available for use by country statisticians by contacting the CDC focal point for the country.)

**Computation plan for sample base weights** (refer to *GATS Sample Design Manual Chapter 11* and *GATS Sample Weights Manual Section 3.1*)

- Detailed explanation of how stage-specific selection probabilities, and thereby sample base weights, will be calculated with a description.
- If the weights will be adjusted for differential response rates among sample subgroups, the calculation of these adjustments should be described in detail.
- Describe in detail how the sample weights will be calibrated to population census counts through post-stratification or iterative raking.
- Describe the prior experience of the country organization in computing sample weights. Verification that individual components of the sample base weights will be made available to the SRC for quality assurance review.



## 4. Workshops and Training

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Once country commits to implementing GATS with global partners including CDC and WHO, there are a series of important steps to successful completion of the survey. These steps include GATS Orientation, Pretest and Training of Field Staff, and the Analysis Workshop. The first step is Orientation to GATS Standard Operating Procedures and Proposal Development. This is followed by Pretest and Training of Field Staff which, are critical and essential stages in GATS to test the survey processes and to train all field staff involved in the full survey. Final step is the analysis workshop, which is held once data collection is completed and data cleaned, and quality assurance and weighting are completed.

### 4.1 Orientation

GATS Orientation provides an overview of the entire GATS process and in-depth review of the comprehensive standard protocol including questionnaire, sample design and an introduction to electronic data collection and management. Countries share their experiences in conducting surveys. The training also goes through guidelines for proposal development and allows for countries adaptation of the protocol to their country situation. Finally, orientation provides a step-by-step guide on proposal development, submission, review and funding critical to initiation and implementation of the survey project.

The aims of the orientation are to:

- Provide an overview of the GATS process and Comprehensive Standard Protocol.
- Finalize adaptations of comprehensive standard protocol, including questionnaire, sample design and proposal.
- Provide an overview of GATS IT and data management.
- Conduct preliminary IT and data management training.
- Meet partner agencies and GATS implementing agency(s).
- Formalize national GATS coordination mechanism and communication strategy.
- Delineate partner roles and responsibilities.
- Finalization GATS timelines and next steps.

### 4.2 Pretest and Training of Staff

The pretest includes training of trainers, training of the IT team, field practice, and debriefing. The pretest allows survey staff to gain experience in training of field staff through training of trainers and field practice. It also assures the survey's quality through testing of the questionnaire, training materials, implementation plan, data collection and aggregation procedures. The pretest is a way of checking the skip patterns in the questionnaire, translation (countries that have translations), awkward wording or inadequate response categories and ultimately address these issues prior to full survey. The pretest involves the training of IT staff and testing of the electronic data collection system and data management (See more details in *Chapter 5 Data Management*).

### ***IT/Data Management Training***

- Provide in-country staff with IT and data management training for software and hardware (GSS Tool Kit, GSS case management software, hardware). Data management training includes data aggregation and preparation of final file for analysis.
- Provide in-country staff with IT and data management support for software and hardware.

### ***Field Interviewer/Field Supervisor Training***

- Provide training to field interviewers and/or field supervisors to conduct GATS.

### ***Conduct pretest***

- Conduct and observe pretest in rural and urban locations.

### ***Debrief GATS staff***

- Needs assessment for main implementation. Debriefing involves WHO, CDC, and other GATS staff.

#### **4.2.1 Pretest Timeline**

There is no specific timeline for conducting GATS Pretest and it may depend on various circumstances in each country. However, overall GATS pretest takes about 8 to 10 days.

Two to three days are set aside for training depending on the training needs of a country. Fieldwork and data collection could be conducted for two to four days. Finally, allow one to two days for debriefing and assessment for full survey implementation.

### **4.3 Full Survey**

The quality of the survey is highly dependent on the quality of training of field staff – Field Interviewers and Supervisors. Standard and effective training for all field staff allows GATS to be carried out on a consistent basis in a high-quality manner by all. GATS procedures for Field Interviewers and Supervisors are covered in detail in the *GATS Field Interviewer Manual* and the *GATS Field Supervisor Manual*.

### **4.4 Analysis Workshop**

The analysis workshop focuses on Sample Weighting, Quality Assurance, Data Analysis and Reporting for GATS data. This involves the review of sample weighting methodology and quality assurance of the data. Analysis of data involves the review of GATS indicators and results tables which, provided the basis for finalization of a draft factsheet and initial drafting of GATS country report. In addition, the analysis workshop discusses data dissemination strategies and drafting key messages from GATS findings.

### **4.5 Checklists and Training Agenda Templates**

#### **4.5.1 Pretest Workshop Checklist**

1. GATS Orientation completion and establish communication mechanism on both technical and administrative related tasks.

2. Any in-country IRB / research ethics requirements fulfillment and obtain a letter/confirmation on the status, if applicable.
3. Approval of pretest questionnaire, sample design and full survey proposal (including pretest proposal) from in-country coordinating committee / technical advisory committee.
4. Adapted pretest questionnaire submission for review and finalization (follows questionnaire review guidelines).
5. Adapted sample design submission (completed sample design framework template and sample design review and finalization template) for review and finalization (follows sample design review guidelines). Note: Countries are encouraged to have the final approval of the sample design before the pretest, but it is not required to proceed with the pretest.
6. Adaptation of manuals including technical question by question specifications and data management model.
7. Translations of adapted manuals and any other materials.
8. Translation and approved English back translation of finalized pretest questionnaire.
9. Submit full survey proposal, including pretest proposal, (translated if required) for review (both technical and budget) and approval.
10. Establish funding mechanism and obtain the funding.
11. Handheld procurement, customs clearance, delivery, maintenance, storage etc.
12. Recruitment of IT staff (requirements: minimum as per Data Management Plan- scope of work to be conveyed to Implementing Agency).
13. Establish an in-country IT contact with CDC/RTI at least 30 days in advance to pretest training.
14. Programming of questionnaire & quality checks of programmed questionnaire.
15. Case file template to be prepared and finalized.
16. Recruitment of field staff (interviewers and supervisors) for pretest.
17. Arrangement of resource persons for the training, at the central staff level.
18. Arrangement of resources such as presentations, logistics, and materials.
19. Other logistics such as invitation for the visit and visa support, if required.
20. Agenda (including training place and number of days) with clear deliverables and assigned tasks (including pre- IT training agenda). (See *GATS Implementation Instructions* for details and agenda template).
21. A team meeting within CDC/WHO/RTI on the workshop planning and process.

#### **4.5.2 Full Survey Training Checklist**

1. Pretest report (CDC focal point observation report, RTI site visit report on IT, implementing agency full length pretest report).
2. Assessment of Pretest: country capability for full implementation (training, software, fieldwork).

3. Questionnaire revisions, review and finalization (follows post pretest review process) (translations are optional).
4. Clearly defined sample design implementation plan and finalization.
5. Clearly defined final data collection and management plan, including data aggregation and analysis plans, as well as plans to transfer to the Data Coordinating Center (DCC) at CDC.
6. Agree on recommendations from pretest reports and implement updates for TOT and full survey implementation.
7. Sample design implementation.
8. Mapping and listing training (as required) and implementation.
9. Obtain approvals of full survey proposal (both technical and budget) and funding.
10. Handheld procurement, customs clearance, delivery, maintenance, storage, etc.
11. Recruitment of additional IT staff (data managers and/or quality control persons).
12. Selection of field research agencies, if required (research agencies will follow their established procedures for recruitment, training and fieldwork as per the agreement with the implementing agency).
13. Additional programming of questionnaire such as modified version programming, additional language programming, additional handheld programming (copying), as required.
14. Quality checks of programmed questionnaire.
15. Recruitment of field staff (interviewers and supervisors) for full survey.
16. Additional adaptation of manuals as required.
17. Data management plan (DMP) implementation such as establishing FTP site and data transfer mechanism.
18. Field work schedule and dates.
19. Prepare sample file/case assignment file for the interviewing team as per the DMP.
20. Arrangement of resource persons for the training.
21. Additional assistance from CDC/RTI IT team as necessary.
22. Central/Regional/State level training/briefing of any new project staff (not fieldworkers), as applicable.
23. Arrangement of resources such as presentations, logistics, and materials (as per training guidelines and agenda).
24. Other logistics such as invitation for the visit and visa support, if required.
25. Fieldwork training details: Agenda (including training place and number of days) with clear deliverables and assigned tasks (including pre- IT training agenda) (please see implementation instructions for details and agenda template).
26. A team meeting within CDC/WHO/RTI on the workshop planning and process.



### 4.5.3 Pretest and Full Survey Schedules

The following templates provide a general overview of the recommended pretest training/implementation and full survey training schedules. It is recommended that pretest training for fieldworkers (interviewers and supervisors) lasts at least 3 days while full survey training for fieldworkers lasts 4 to 5 days. However, the schedules can be modified by each country as appropriate.

#### ***Pretest***

Day	Task	Specific Objectives
1 – 3*	IT/DM Training Days 1 – 3	Provide in-country staff with IT and data management training for software and hardware (GSS Tool Kit, GSS case management software, hardware).
3 – 5*	FI/FS Training Days 1 – 3	Provide training to field interviewers and/or field supervisors to conduct GATS.
6 – 8	Conduct pretest	Conduct and observe pretest in rural and urban locations.
9	Data Management	Aggregate data; prepare pretest data file for analysis.
10	Debrief GATS staff	Needs assessment for main implementation; debriefing of WHO, CDC, and other GATS staff.

\*The last day of IT/DM training can occur on the same day as the first day of FI/FS training because the instruction on using handheld devices usually begins on the second day of FI/FS training. This allows the entire schedule to be shortened by one day.

#### ***Full Survey***

Day	Task	Specific Objectives
1 – 3*	IT/DM Set-up Days 1 – 3	Provide in-country staff with IT and data management support for software and hardware (GSS Tool Kit, GSS case management software, hardware).
3 – 7*	FI/FS Training Days 1 – 5	Provide training to field interviewers and/or field supervisors to conduct GATS. (This may be a training of trainers or TOT session.)

\*The last day of IT/DM training can occur on the same day as the first day of FI/FS training because the instruction on using handheld devices usually begins on the second day of FI/FS training. This allows the training schedule to be shortened by one day.

#### 4.5.4 IT/Data Management Training Workshop Agenda

IT/DM training is recommended to last at least 3 days but can be modified based on country capacity and prior training and experience. See *GATS Data Management Training Guide* for further details about training topics.

<b>Day 1</b>	Morning	Session 1: Final review of questionnaire a. Review final questionnaire on handheld device and screen b. Build case file
	Afternoon	Session 2: Set up all handhelds a. Create handheld device configuration files b. Set up handheld configuration process c. Reset all handheld devices d. Set up all handheld devices for training
<b>Day 2</b>	Morning	Session 3: Understand the QC process and conduct QC on all handhelds a. Discuss overview and purpose of QC b. Explain method of conducting QC1 and QC2 and finalize all handheld devices for training c. Load case file after training
	Afternoon	Session 4: Data monitoring and creating the master dataset a. Data aggregation and transpose b. Data monitoring—reports <ul style="list-style-type: none"><li>• Response rates</li><li>• Pending final event codes</li><li>• Discuss training field supervisors and field interviewers on event coding and finalizing all cases</li></ul> c. Generate analysis files
<b>Day 3</b>	Morning	Session 5: Training preparation and role play a. Review training process using modules 3 and 4 b. Conduct full circle role play c. Review summary and action plan for full survey
	Afternoon	Time available if needed

#### 4.5.5 Field Interviewer/Field Supervisor Training Workshop Agenda

A recommended 5-day fieldworker training agenda is provided below. This can be condensed into fewer days, if appropriate (e.g., for pretest training).

<b>Day 1</b>	Morning	Welcome and Introductions Objectives of GATS Overview of GATS Materials Protocol and Procedures Roles and Responsibilities Sampling Review of General Interviewing Techniques / Non-sampling Errors
	Afternoon	Question by Question Review of Household Questionnaire (Paper) Question by Question Review of Individual Questionnaire (Paper)
<b>Day 2</b>	Morning	Question by Question Review of Individual Questionnaire (Paper) ( <i>continued</i> )
	Afternoon	Introduction to the Handheld Overview of the Case Management System (CMS) Demonstration of the Household Questionnaire (Handheld) "Round Robin" Using Household Questionnaire (Handheld)
<b>Day 3</b>	Morning	Demonstration of the Individual Questionnaire (Handheld) Round Robin Using Individual Questionnaire (Handheld)
	Afternoon	Paired Mock Interviews (Household and Individual)
<b>Day 4</b>	Morning	Review of Pending and Final Result Codes (Household and Individual) Visit Record in CMS Visit Record Practice (Group Exercise)
	Afternoon	Paired Mock Interviews (Household and Individual)
<b>Day 5</b>	Morning	(Field Interviewers) Paired Mock Interviews (Field Supervisors) Data Transfer; Quality Assurance
	Afternoon	Assignments Administrative Issues Closing



## 5. Data Management

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GATS Data Management consists of hardware and software components used to collect and process data gathered in the field. Hardware consists of handheld devices, a Windows PC/Laptop computer and their associated peripherals. Software consists of applications and programs for the handheld devices and for the PC/Laptop computer.

### 5.1 Handheld Devices

The overarching goal of GATS is to develop a rigorous system to monitor the status of global tobacco use. GATS partners conducted a thorough evaluation of the use of Electronic Data Capturing (EDC) for GATS and concluded the use of EDC devices for GATS is not only feasible but also highly recommended.

The use of handhelds improves the speed, quality, and cost of data collection and management for GATS. The significant gains in data accuracy, availability, and management, justify the implementation of handheld devices for GATS interviews and enhance the countries' capacity in using these devices for future non-GATS surveys.

To help ensure the success of GATS and handhelds, CDC and RTI will assist with handheld implementation. Assistance includes participation during the GATS in-country technical workshops and ongoing technical support throughout the survey implementation.

The partners also evaluated the available hardware and software for GATS compatibility. Hardware and software have been selected based on the ease of implementation and use at the in-country field level. Additional factors such as the ability to standardize both the data collection and data analysis process were also considered during the evaluation of handhelds.

The partners reviewing handhelds also determined that even though some GATS countries demonstrate proficiency in handheld use, other GATS countries have limited handheld experience and will require assistance implementing handheld devices. Implementation assistance includes but is not limited to the training of appropriate country staff in questionnaire design/development, field interviews using handhelds, data security, and data transmission.

In conclusion, the partners are fully committed to handheld use for GATS. Additional and ongoing work will be needed to address logistics such as procurement, technical support, and data management; however, GATS partners continue to work together to ensure the successful implementation of handhelds for the survey.

### 5.2 Software

GATS General Survey System (GSS) is a suite of software tools developed to facilitate the administration, collection, and management of survey data on handheld devices. The software system is designed to support data collection activities where field interviewers collect data using handheld devices. The software consists of four main programs, each dedicated to a specific function:

1. CMS: a case management system that allows users to manage the case load on the handheld device.
2. GSS Engine: a questionnaire development and presentation system engine that allows defining of data collection forms on a standard desktop PC and execution of these data collection forms or questionnaires on the handheld device.
3. Desktop Tool Kit: a developer's menu system that organizes the access to the PC-based components of GSS.
4. Questionnaire Designer: a questionnaire design program that provides a visual interface for preparing and/or modifying a survey questionnaire. The Designer allows the creation, deletion, and modification of questions, answer sets, ranges, skip patterns and other related questionnaire components in multiple languages.

The CMS application and the GSS Engine run on the handheld device that the field interviewer uses, and the Desktop Tool Kit runs on a Microsoft Windows-based laptop or desktop PC. Additional software is utilized depending on the country's needs.

The handheld devices collect encrypted data in the field, and through an option in the CMS application, the data are exported and transmitted via the cloud to the country's IT staff. Once received, the data are processed using the Desktop Tool Kit for decryption, aggregation and reporting.

### 5.3 IT and Data Management Checklists for Orientation, Pretest and Full Study

IT AND DATA MANAGEMENT CHECKLISTS	
ORIENTATION PREPARATION	
Task	Responsibility
Orientation email send to IT lead participant(s)	CDC
Identify country IT Lead who will support GATS day-to-day	Country
Confirm IT lead will bring laptop with appropriate admin rights, appropriate software	Country
Provide to country preferred skill set for country IT Lead	CDC
Send IT/DM manuals to country	CDC
Confirm if handheld device is provided by GATS or by country; if by country, confirm country will bring handheld device to Orientation	CDC/Country
Confirm country languages	CDC/Country
PRETEST PREPARATION	
Task	Responsibility
Confirm names and roles of IT participants in IT/DM training	CDC/Country
Confirm that IT participants will be attending entire training	Country
Confirm that translator(s) are available for training in all languages	Country
Confirm internet access available at training location including sufficient Wi-Fi capability for all devices needing connections	Country
Confirm power outlets available for device charging needs	Country

Confirm a projector(s) are available for entire training	Country
Confirm all handheld devices have been fully charged, initial setup is complete and all accessories are available	Country
Confirm that SIM cards have been purchased, activated and installed prior to training, if applicable	Country
Confirm a safe location to store handheld devices during training	Country
Confirm sample file and plan are available for pretest	Country
Create Case File for Pretest implementation	CDC/Country
Load cases on handheld devices	CDC/Country
Complete QA of handheld devices	CDC/Country
Confirm GATS laptop/desktop is configured	CDC/Country
Confirm Dropbox, FTP or other related transmission system is ready and configured	CDC/Country
Confirm number of Field Supervisor and Field Interviewers that will participate in Pretest	CDC/Country
Confirm questionnaire programming and language import has been completed	CDC/Country
Finalize IT/Data Management training agenda	CDC
<b>FULL STUDY PREPARATION</b>	
<b>Task</b>	<b>Responsibility</b>
Confirm sample file has been finalized	CDC/Country
Create, review and approve Case File for implementation	CDC/Country
Confirm questionnaire programming is finalized	CDC/Country
Confirm Case Info fields are finalized	CDC/Country
Confirm Case Item Layout is finalized (main screen)	CDC/Country
Load cases on handheld devices	Country
Complete quality assurance checks (QA) of handheld devices	Country
Confirm GATS laptop/desktop is configured	Country
Confirm Dropbox, FTP or other related process is ready/configured	Country
Confirm all handheld devices have been fully charged, initial setup is complete and all accessories are available	Country
Confirm that SIM cards have been purchased, activated and installed prior to training, if applicable	Country
Confirm country support plans for implementation	Country
Confirm country plan for sharing of status reports	CDC/Country





## 6. Sample Weights: Review and Finalization Process

This chapter provides information for developing the country-specific GATS sample weights and quality assurance process for review and approval. The GATS Sample Review Committee (SRC) oversees the computation of sample weights and quality assurance documentation development and approvals. Participating GATS countries and GATS partners should adhere to these guidelines in order to maintain accurate computations of sample weights and data quality assurance. This chapter includes review process and timeline, and quality assurance of sample weights reporting template.

### 6.1 Review Process and Timeline

Action Number	Responsible	Task
1	CDC	<ul style="list-style-type: none"><li>Send <i>GATS Sample Weights Manual</i> (including standard sample weighting process and requirements) to IA.</li></ul>
2	IA	<ul style="list-style-type: none"><li>Review of standard sample weighting requirements and acquire preliminary information required for the sample weighting discussions.</li><li>Prepare a summary of sample weighting process and procedures, and forward it to CDC focal point for approval.</li></ul>
3	SRC	<ul style="list-style-type: none"><li>Review summarized process and proposed sample weighting procedure.</li><li>Send approval on the weighting process or suggestions/adaptations on sample weighting to IA through CDC focal point.</li></ul>
4	IA, CDC	<ul style="list-style-type: none"><li>Work with CDC focal point to finalize the adapted/approved procedures and compute sample weights and related quality assurance measures on sample weights.</li><li>Send the detailed procedure and quality assurance measures to SRC through CDC focal point.</li></ul>
5	CDC, SRC	<b>Review Process:</b> <ul style="list-style-type: none"><li>CDC focal point to review and organize expert review on sample weights and related quality assurance measures.</li><li>Convey the approval of sample weights to IA.</li><li>Communication and technical assistance between IA and SRC to finalize sample weights as needed.</li></ul>
6	IA	<ul style="list-style-type: none"><li>Upon receiving SRC approval notification in writing, start the country report statistical tables generation.</li></ul>

CDC	U.S. Centers for Disease Control and Prevention
IA	Implementing Agency
QRC	Questionnaire Review Committee
WHO RO	World Health Organization Regional Office

#### Notes:

- The process is strictly confidential and at any stage the sample design/weights, in part or full, should not be disclosed or shared to any other members or person outside SRC without the prior approval/permission from the IA and CDC.
- Communication between IA and CDC focal point should be copied to the WHO RO.
- Titles of documents should consist of the date in which they were created to ensure version control.

## Timeline for Sample Weights and Quality Assurance Review Process

Action Number	Task	Approximate Number of Days
3	SRC will review the proposed process and procedures of sample weights.	4 working days
3	Based on the comments if needed, a conference call will be organized with available SRC members and IA and/or NSO focal point to finalize sample weights (CDC focal point will schedule the call).	1 working days
5	SRC will review the sample weights and related quality assurance measures.	5 working days
5	Further adaptation/implementation of sample weights computations and additional quality assurance measures as needed.	5 working days
5	Ongoing technical assistance will be provided by experts to IA as needed until the sample weights and related quality assurance measures are computed.	Ongoing

**Note:** SRC members are requested to give their comments in writing (with clarifications) to ease the process. Timeline can be impacted by review complexity or additional consultation needs.

## 6.2 Quality Assurance of Sample Weights — Reporting Template

A template was developed based on the *GATS Sample Weights Manual*. The following quality assurance measures are to be computed and accompanied with a detailed report on sample weights for SRC review and approval.

### 1. Key Documentation on Sample Weighting Process

Include the following for the review and finalization of sample weights:

- Key accomplishments and processes on fieldwork and data collection.
- Sample selection process and members participated in production of sample selection.
- Description of data collection operation.
- Objectives and outcomes of sample weights workshop, if relevant.
- Sample weighting process description and members participated in sample weighting.
- Quality assurance (QA) checks of sample weighting (refer the checklist below).
- Relevant tables and information be provided to verify the computational checks of sample weighting.

### 2. Checklist on Quality Control Measures for Producing Sample Weights

- Careful documentation of sample selection steps.
- Compute measures of the multiplicative effect of variable sample weights for the sample overall and for all population subgroups for which GATS findings are to be presented (e.g., by gender, urban-rural, region, etc.);

Compute: 
$$M_{eff_w} = 1 + \frac{S_w^2}{\bar{w}^2} \quad (\text{trim weights if } > 2.00)$$

- c. Compute and profile estimates of the overall design effect (*Deff*) for all tobacco use prevalence rate estimates to be presented in the factsheet of GATS findings, indicating also for each estimate:
  - i. The number of GATS respondents use to produce the estimate, and
  - ii. The estimated standard error (or relative standard error) of the estimate.
- d. Some computational checks:
  - i. Certify that computation of weights was independently verified by another knowledgeable staff person;
  - ii. Compare the average size of base weights and nonresponse-adjusted weights by computing:
 
$$\bar{B} / \bar{W}^{(nr)} \approx \text{Overall Response Rate}$$
  - iii. Demonstrate that the weighted distribution of final sample weights, by post-stratification adjustment cells, matches the distribution of population counts by cell;
  - iv. Verify that the sum of final sample weights = population size; and
  - v. Profile the size of post-stratification adjustments, which should be slightly less or greater than 1.00.

**Notes:**

- It is recommended that an Excel table be provided to verify checks related to 4c, 4d, and 4e.
- The completed template should be submitted to the CDC focal point for SRC approval.
- Please refer to the *GATS Sample Weights Manual* and *GATS Quality Assurance: Guidelines and Documentation (Chapter 5)* for additional details.



## Appendix A: Frequently Asked Questions

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### **What is GATS?**

The Global Adult Tobacco Survey (GATS) is a standardized global survey used to systematically monitor adult tobacco use and track key tobacco control indicators. GATS is a nationally representative household survey of adults aged 15 years and older, using a consistent and standard protocol which enables unprecedented cross-country and change-over-time comparisons for countries that repeat the survey. GATS is a component of the Global Tobacco Surveillance System (GTSS) which also includes: the Global Youth Tobacco Survey (GYTS), Tobacco Questions for Surveys (TQS), and Tobacco Questions for Surveys of Youth (TQS-Youth).

### **Who are the national partners and international partners in GATS?**

National partners include the ministry of health as the lead coordinating agency for GATS and either the national statistical organization or a renowned survey institute as the implementing agency. International partners include the World Health Organization (WHO), U.S. Centers for Disease Control and Prevention (CDC), Johns Hopkins Bloomberg School of Public Health, RTI International, and the CDC Foundation.

### **Why monitor tobacco use among adults?**

Tobacco is the leading preventable cause of premature disease and death worldwide. Tobacco control requires an effective surveillance mechanism to monitor trends in prevalence and other key indicators such as smoke-free environments, advertising bans, and cessation. Surveillance and monitoring are important public health tobacco use tools. They provide critical information to strengthen programs and policies, and to evaluate their effectiveness. “If you can’t measure it, you can’t manage it.”

### **What topics are covered in GATS?**

The GATS core questionnaire collects information on respondents’ background characteristics, tobacco use (smoking and smokeless tobacco), use of electronic cigarettes, cessation, secondhand smoke exposure, economic situation, mass media exposure, and knowledge, attitudes and perceptions towards tobacco use. There are also additional optional questions covering other topics including the use of heated tobacco products.

### **What can be accomplished with GATS at the country level?**

Countries will have nationally representative data on tobacco use among their adults and on key measures of tobacco control. In addition, the data collected can be compared within countries having multiple rounds of data and across countries that implemented GATS. Thus, the survey results can be used to better understand comparative patterns of tobacco use within and between countries. These can be used to create more effective control programs and monitor the impact of these programs. Over time, GATS will provide detailed information on a range of tobacco-control topics, including cessation, secondhand smoke, economics, media, and knowledge, attitudes, and perceptions. Countries will also have an opportunity to be a part of GTSS.

## **How does GATS relate to the World Health Organization's Framework Convention on Tobacco Control (WHO FCTC) and the WHO MPOWER package?**

GATS assists countries in fulfilling their obligations under the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) to generate comparable data within and across countries. WHO developed MPOWER, a technical package of selected demand reduction measures contained in the WHO FCTC:

- M**onitor tobacco use and prevention policies
- P**rotect people from tobacco smoke
- O**ffer help to quit tobacco use
- W**arn about the dangers of tobacco
- E**nforce bans on tobacco advertising, promotion, and sponsorship
- R**aise taxes on tobacco

## **When will GATS data become publicly available?**

GATS data will be made available to the public on the GTSS data website 1 year after the initial results have been released by the national government. Data approval by the Data Coordinating Center (DCC) is necessary before release of the public use data set (PUDS).

## **When will GATS be repeated?**

Countries are encouraged to repeat the survey every 4-5 years.

## **What is the role of the Data Coordinating Center (DCC)?**

CDC serves as the Data Coordinating Center and depository of GTSS data. The DCC provides data management, quality assurance, standardization, and data repository functions along with provisioning data sharing, release and dissemination. The DCC ensures the following:

- Individual countries can be assured their data will receive high quality support;
- As countries begin to repeat surveys, they will be assured that their analysis of trends will be grounded in strong and consistent statistical procedures and practices; and
- A coordinated process will enable standardized analysis which will be important to the direction and development of global tobacco control programs and policies.

## **How is GATS different from other surveys?**

GATS is a stand-alone, in-depth tobacco survey using a standard and consistent protocol (questionnaire, sample design, training, data collection and management, quality assurance, and data analysis and reporting). Data are collected face-to-face using handheld computers. Using a standard set of GATS questions will improve the comparability of survey estimates over time and harmonize these estimates with the results of international tobacco surveillance and monitoring activities.

## **What are the requirements for countries to be a part of GATS?**

To be a part of GATS, countries must adhere to the scientific and technical requirements of the GATS comprehensive standard protocol. This means that the country must have its proposed questionnaire on tobacco use approved by a GATS expert review committee. In addition, the sample review committee will examine the sample design, sample weights, quality assurance measures, and plan for analysis of the data obtained.

**How does a country get involved in GATS?**

If a country is interested in implementing GATS it should contact the WHO Regional Office or the CDC.

**What is the mechanism for countries that partially or fully fund GATS and wish to be a part of GTSS?**

Countries may decide to fully or partially fund the implementation of GATS. However, to be part of the GTSS, countries must adhere to the technical and scientific requirements of the GATS comprehensive standard protocol. Technical assistance and review of the protocol and its approval by experts are available from WHO and CDC for all countries.

**What mechanisms other than the stand-alone GATS are available to countries to monitor tobacco use?**

To promote systematic monitoring of tobacco use, countries around the world can use a standard subset of 22 questions selected from the GATS core questionnaire entitled “*Tobacco Questions for Surveys: A Subset of Key Questions from the Global Adult Tobacco Survey (GATS)*.” Using these questions will help countries improve the comparability of their national survey estimates over time and harmonize them with findings from international tobacco surveillance and monitoring activities. Within their existing national surveys, countries can add their own tobacco module and/or incorporate the standard subset of 22 GATS questions. (Note that comparing estimates from TQS to GATS must be done carefully due to methodological differences between the surveys.)







## Global Adult Tobacco Survey (GATS)